AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An ultrasonic transmitter comprising:

a transducer having a plurality of transducer elements, each transducer element being associated with a separate channel, arranged on a surface of the transducer; and

a transmitting beamformer which provides commands to generate carrier drive signals for forming an ultrasonic transmitting beam by driving the multiple transducer elements with the carrier drive signals;

wherein said transmitting beamformer generates a control signal, for each channel, for controlling pulse durations of a reference signal to generate a carrier drive signal, further wherein the control signal is based upon at least one channel dependent parameter.

2. (Previously Presented) The ultrasonic transmitter according to claim 1, wherein the transmitting beamformer includes:

a control signal generator for generating a rectangular pulse signal of a specific frequency and the control signal for controlling the waveform of a reference signal on which a pulse-duration modulation process is performed; and

a carrier drive signal generator for generating the carrier drive signal by pulse-duration-modulating the reference signal based on the rectangular pulse signal and the control signal.

3. (Original) The ultrasonic transmitter according to claim 2, wherein the control signal is a signal made up of binary values 0 and 1.

4. (Previously presented) The ultrasonic transmitter according to one of claims 1, 2 or 3, wherein the transmitting beamformer controls directivity of the transmitting beam by varying the amplitude of the carrier drive signals for driving each of the multiple transducer elements based on weight data previously stored in the transmitting beamformer.

5. (Previously Presented) The ultrasonic transmitter according to one of claim 1 through 3, wherein the transmitting beamformer varies the amount of time delay introduced into the carrier drive signal for driving each of the multiple transducer elements based on time delay data previously stored in the transmitting beamformer.

6. (Original) The ultrasonic transmitter according to claim 5, wherein the time delay data includes coarse time delay data and precision time delay data, and the transmitting beamformer perform precision delay control operation based on the precision time delay data after performing coarse delay control operation based on the coarse time delay data.

7. (Previously Presented) The ultrasonic transmitter according to one of claims 1 through 3, wherein the carrier drive signals are produced having different frequencies.

8. (Previously Presented) An ultrasonic transceiver comprising:

the ultrasonic transmitter according to one of claims 1 through 3; and

a receiving beamformer for forming an ultrasonic receiving beam by controlling signals produced from ultrasonic waves received by the multiple transducer elements of the transducer.

9. (Original) A sonar apparatus comprising:

the ultrasonic transceiver according to claim 8; and

a device for controlling the receiving beamformer to scan successive sounding directions within the transmitting beam and pick up echo signals from the individual sounding directions and for displaying detected echo data obtained from the echo signals.

10. (Cancelled)

11. (Previously Presented) The ultrasonic transmitter according to claim 1, wherein the parameter includes time delay or weight value.

12. (Previously Presented) The ultrasonic transmitter according to one of claims 1, 2, or 3, wherein the transmitting beamformer controls an envelope of the carrier drive signal by varying the amplitude of the carrier drive signal based on envelope data stored in the transmitting beamformer.

13. (Previously presented) A method for controlling the transmission of an ultrasonic signal from a transducer array, comprising:

computing at least one parameter based upon a channel of a transducer element in the transducer array;

determining waveform parameters for a carrier drive signal based upon the at least one parameter; and

providing at least one interface signal to generate a carrier drive signal, wherein the at least one interface signal is based upon the at least one parameter and is used to control a pulse duration modulation process.

14. (Previously Presented) The method according to claim 13, wherein the at least one parameter includes time delay or weight value.

15. (Previously Presented) The method according to claim 13, wherein the at least one interface signal includes a control signal or a clock signal.

16. (Previously Presented) The method according to claim 15, wherein the control signal is a binary signal which indicates durations of a pulse-duration modulated signal.